Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

1989 MAZDA RX-7 (FC) OEM Service and Repair Workshop Manual

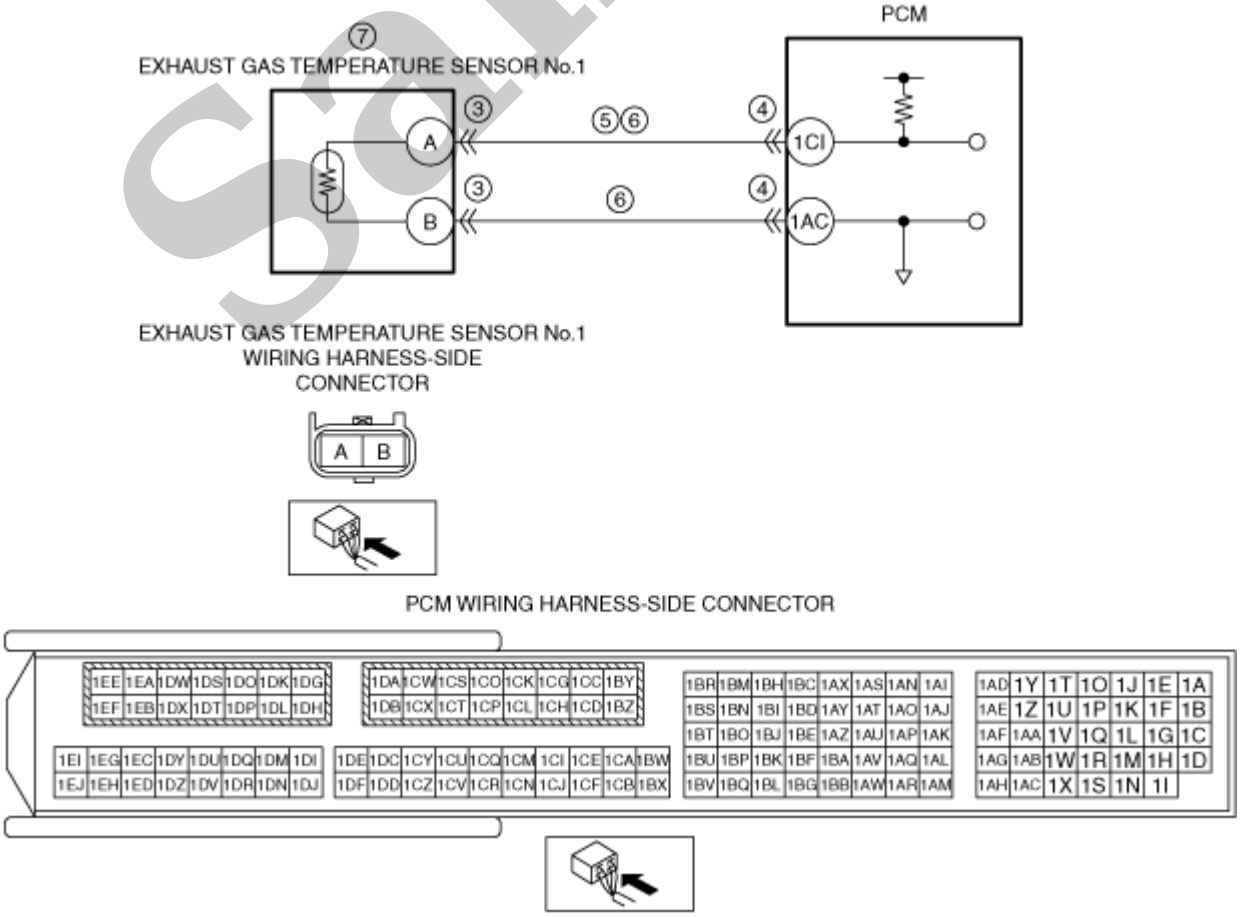
Go to manual page

DTC P0545:00 [PCM (SKYACTIV-D 2.2)]

SM2896049

id0102j515580

DTC P0545:00	Exhaust gas temperature sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the exhaust gas temperature sensor No.1 signal. If the PCM detects that the exhaust gas temperature sensor No.1 voltage at the PCM terminal 1CI is below 0.41 V for 5 s, the PCM determines that the exhaust gas temperature sensor No.1 circuit has a malfunction. MONITORING CONDITIONS — Battery voltage: 8 V or more **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Limits the engine torque or the upper limit of the engine speed. • Inhibits the automatic diesel particulate filter regeneration control and compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Inhibits the EGR control.
POSSIBLE CAUSE	• Exhaust gas temperature sensor No.1 connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between exhaust gas temperature sensor No.1 terminal A and PCM terminal 1CI • Exhaust gas temperature sensor No.1 signal circuit and ground circuit are shorted to each other • Exhaust gas temperature sensor No.1 malfunction • PCM malfunction



DTC P0546:00 [PCM (SKYACTIV-D 2.2)]

SM2896050

id0102j515590

DTC P0546:00	Exhaust gas temperature sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the exhaust gas temperature sensor No.1 signal. If the PCM detects that the exhaust gas temperature sensor No.1 voltage at the PCM terminal 1CI is above 4.91 V for 5 s, the PCM determines that the exhaust gas temperature sensor No.1 circuit has a malfunction. MONITORING CONDITIONS — Battery voltage: 8 V or more Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Limits the engine torque or the upper limit of the engine speed. • Inhibits the automatic diesel particulate filter regeneration control and compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Inhibits the EGR control.
POSSIBLE CAUSE	• Exhaust gas temperature sensor No.1 connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between exhaust gas temperature sensor No.1 terminal A and PCM terminal 1CI • Open circuit in wiring harness between the following terminals: — Exhaust gas temperature sensor No.1 terminal A—PCM terminal 1CI — Exhaust gas temperature sensor No.1 terminal B—PCM terminal 1AC • Exhaust gas temperature sensor No.1 malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
8	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-D 2.2)].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
9	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

DTC P115B:00 [PCM (SKYACTIV-D 2.2)]

SM2896053

id0102j515670

DTC P115B:00	Low fuel level - Forced engine shutdown
DETECTION CONDITION	• "Injection amount cumulative value after lowering point E", which is calculated by the PCM, exceeds the threshold value (larger than DTC P0313:00). Diagnostic support note • This is an intermittent monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA/Snapshot data is not available. • DTC is not stored in the PCM memory.
FAIL-SAFE FUNCTION	• Regulates the upper limit of the APP sensor output. • Inhibits the diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control.
POSSIBLE CAUSE	• Fuel runout • Fuel gauge (integrated in instrument cluster) malfunction • Fuel gauge sender unit malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	VERIFY RELATED SERVICE INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	INSPECT WHETHER MALFUNCTION IS FUEL RUNOUT OR OTHER • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Switch the ignition off. • Refill the fuel above 9 L {2 US gal, 2 Imp gal}. • Start the engine and warm it up completely. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the DTC P115A:00, P0313:00 or P115B:00 present? Note • If the refueling amount is low, the PCM stored DTC P115A:00, P0313:00 or P115B:00 continues.	Yes	Go to the next step.
		No	Any other PENDING CODEs and/or DTCs are present: • Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].) Any other PENDING CODEs and/or DTCs are not present: • The cause of this DTC is low fuel level. — DTC troubleshooting completed.

STEP	INSPECTION		ACTION
3	**INSPECT WHETHER MALFUNCTION IS FUEL RUNOUT OR OTHER** • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Switch the ignition off. • Refill the fuel above 9 L {2 US gal, 2 Imp gal}. • Start the engine and warm it up completely. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the DTC P115A:00 or P0313:00 present? **Note** **• If the refueling amount is low, the PCM stored DTC P115A:00 or P0313:00 continues.**	Yes	Go to the next step.
		No	Any other PENDING CODEs and/or DTCs are present: • Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].) Any other PENDING CODEs and/or DTCs are not present: • The cause of this DTC is low fuel level. — DTC troubleshooting completed.
4	**REINSPECT WHETHER MALFUNCTION IS FUEL RUNOUT OR OTHER** • Switch the ignition off. • Refill the fuel till fuel level is above 9 L {2 US gal, 2 Imp gal}. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Switch the ignition off. • Refill the fuel above 9 L {2 US gal, 2 Imp gal}. • Start the engine and warm it up completely. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the DTC P115A:00 or P0313:00 present?	Yes	Inspect the fuel gauge. (See INSTRUMENT CLUSTER INSPECTION.) • Repair or replace the malfunctioning part according to the inspection results, then go to the next step. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
		No	Any other PENDING CODEs and/or DTCs are present: • Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].) Any other PENDING CODEs and/or DTCs are not present: • The cause of this DTC is low fuel level. — DTC troubleshooting completed.
5	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Start the engine and warm it up completely. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

DESCRIPTION	P020A:00: Fuel injector No.1 system: Fuel injection function malfunction
	P020B:00: Fuel injector No.2 system: Fuel injection function malfunction
	P020C:00: Fuel injector No.3 system: Fuel injection function malfunction
	P020D:00: Fuel injector No.4 system: Fuel injection function malfunction
POSSIBLE CAUSE	• Fuel injector No.1 malfunction • Fuel injector No.2 malfunction • Fuel injector No.3 malfunction • Fuel injector No.4 malfunction • Fuel pressure sensor/fuel temperature sensor No.1 (built-into fuel injector No.1) malfunction • Fuel pressure sensor/fuel temperature sensor No.2 (built-into fuel injector No.2) malfunction • Fuel pressure sensor/fuel temperature sensor No.3 (built-into fuel injector No.3) malfunction • Fuel pressure sensor/fuel temperature sensor No.4 (built-into fuel injector No.4) malfunction • PCM malfunction

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM monitors the fuel injection timing.
• If the number of times a deviation occurs at the fuel injection timing exceeds a certain number, the PCM stores a DTC.

Repeatability Verification Procedure

1. Start the engine and warm it up completely.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defogger) are off.
3. Drive the vehicle on a flat road surface 5 times under the following conditions.
    1. Idle the engine for 20 s.
    2. Shift to 2nd gear and accelerate the vehicle to 35 km/h {22 mph} and drive the vehicle at a constant speed for 25 s.
    3. Stop the vehicle.
    4. Switch the ignition to off and wait for 20 s or more.
    5. Start the engine.
    6. Shift to 3rd gear and accelerate the vehicle to 50 km/h {31 mph} and drive the vehicle at a constant speed for 50 s.
    7. Stop the vehicle and idle the engine for 20 s.
4. Stop the engine.

PID Item/Simulation Item Used In Diagnosis

• Not applicable

Function Inspection Using M-MDS

DTC P1051:00, P1053:00, P1055:00, P1057:00 [PCM (SKYACTIV-D 2.2)]

SM2896132

id0102j532450

Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

STEP	INSPECTION	RESULTS	ACTION
2	**PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P1051:00, P1053:00, P1055:00 or P1057:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
3	**PURPOSE: RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION** **Note** **• Recording can be facilitated using the screen capture function of the PC.** • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
4	**PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY DTC OCCURRING FROM FUEL INJECTOR** • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is a DTC related to the fuel injector present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
5	**PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY DTC OCCURRING FROM FUEL PRESSURE SENSOR** • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is a DTC related to the fuel pressure sensor present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
6	**PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY DTC OCCURRING FROM FUEL TEMPERATURE SENSOR** • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is a DTC related to the fuel temperature sensor present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Caution

• If a hand or tool touches a fuel injector terminal or fuel injector connector terminal, the fuel injector might be damaged. To prevent damage to a fuel injector, do not touch the terminals.
• If high-voltage generating parts or components and electronic devices come near a fuel injector, the fuel injector could be damaged. To prevent damage to a fuel injector, always keep high-voltage generating parts or components and electronic devices away from it.

Intention of troubleshooting procedure

- Step 1
  - — Perform a unit inspection of the fuel injector No.1–No.4.
- Step 2
  - — Inspect the fuel pressure sensor No.1–No.4.
- Step 3
  - — Inspect the fuel temperature sensor No.1–No.4.
- Step 4–5
  - — Verify that primary malfunction is resolved and there are no other malfunctions.